

# Solutions - 2009 General Mathematics Trial

## Multiple Choice.

1. C	5. A	9. B	13. C	17. D	21. B
2. D	6. C	10. C	14. C	18. D	22. C
3. B	7. D	11. D	15. B	19. A	
4. C	8. D	12. B	16. A	20. A	

Q23(a) (i)  $7x - 10y$

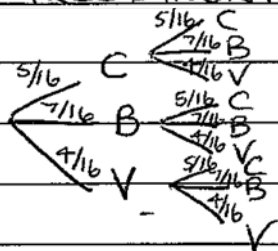
(ii)  $10x^2y^{-2}$  or  $10x^2/y^2$

(iii)  $1024x^{10}y^{15}$

(b)  $x = 30$

(c) (i) TREE DIAGRAM

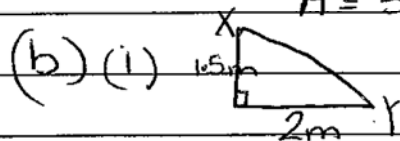
Chocolate(C) Berry(B) Vanilla(V)



(ii)  $P(CC) = \frac{5}{16} \times \frac{5}{16} = \frac{25}{256}$

(iii)  $P(\text{Not } C) = \frac{121}{256}$

Q24 (a)  $h = 6$   $A = \frac{6}{3}(14 + 4(16) + 15) + \frac{6}{3}(15 + 4(14) + 10)$   
 $A = 348\text{m}^2$



$XY = \sqrt{1.5^2 + 2^2} = 2.5\text{m}$

(ii)  $2.5 \times 4.5 = 11.25\text{m}^2$

(iii)  $30\text{mm} = 0.03\text{m}$

$V = Ah = 11.25 \times 0.03 = 0.3375\text{m}^3$

(iv)  $A = \pi r^2$   $V = 0.3375$

$V = Ah$   $0.3375 = \pi h$

$h = 0.107\text{m}$  or  $10.7\text{cm}$

(c) (i) 120

(ii) swimmers have different swimming abilities

Q25(a)(i)  $360 - 306 = 54$        $90 + 54 = 144^\circ$

(ii)  $AC^2 = 3.5^2 + 5.5^2 - 2 \times 3.5 \times 5.5 \times \cos 144$

$AC^2 = 73.6$

$AC = 8.6 \text{ km}$

(b)(i)  $20\% \times 15000 = \$3000$

(ii)  $3000 + 310 \times 12 \times 4 = \$17880$

(iii)  $17880 - 15000 = \$2880$

(iv)  $r = \frac{2880}{12000 \times 4} = 0.06 = 6\% \text{ pa}$

(c)(i)  $\$6644.21$

(ii)  $\$94917.24 + \$6644.21 = \$101561.45$

(iii)  $\$101561.45 - \$8581 = \$92980.45$

(iv) repay more than  $\$8581$  per year

OR reduce the interest rate

OR make repayments over smaller time increments

OR make additional repayments

Q26(a)(i) Range = 55    Int-Range = 25    median = 70

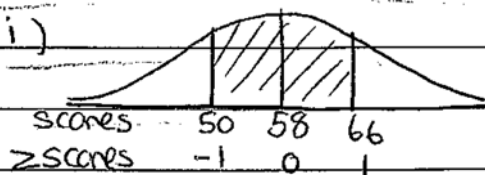
(ii) median whilst tired = median after drinking

(iii) Range after drinking is larger than range when tired

(b)(i)  $\bar{x} = 58$      $s = 8$      $x = 64$      $z = 0.75$

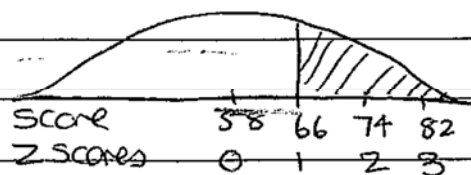
(ii)  $z = -0.5$      $s = 8$      $\bar{x} = 58$      $x = 54$

(iii)



68%

(iv)



16% of 50

= 8 students

(c)(i)  $C = 12x + 700$

(ii) Before = no profit    After = profit

(iii) When  $x = 150$      $R = \$3000$      $C = \$2500$

profit =  $\$500$

Q27(a) (i)  $r = 3.5$   $h = 12$   $V = \frac{1}{3} \pi r^2 h$   
 $V = 154 \text{ cm}^3$

(ii)  $r = 3.5$   $V = \frac{4}{3} \pi r^3$   $V = 180 \text{ cm}^3$

(b)(i)  $225^\circ = 900 \text{ minutes} = 15 \text{ hours}$

(ii) New York is 15 hours behind Sydney  
 4am Saturday

(c) Angular distance  $= 11^\circ$

Distance  $= 660 \text{ M}$  Speed  $= 8 \text{ knots}$

Time  $= \frac{D}{S} = \frac{660}{8} = 82.5 \text{ hours}$

(d)(i)  $\bar{x} = 231$   $\frac{\sum S}{S_n} = 23.8$

(ii) Type A because standard deviation is smaller

(iii) z score for A  $= 3.7$

z score for B  $= 2.8$

Most likely the plant was Type B because  
 z score is smaller.

Q28(a) (i)	Test indicates		Total
	SF	Test does not	
with SF	40	10	50
without SF	20	130	150
	60	140	200

(ii)  $40 + 130 = 170$

(iii)  $85\%$

(iv)  $2/5$

(b) (i)  $25/36$

(ii)  $\frac{1}{36}(20) + \frac{10}{36}(2) + \frac{25}{36}(-2) = -0.27$

(c) (i)  $(45, 27.5)$

(ii) 1

(iii) positive linear correlation

(iv) correlation coefficient can not  
 be greater than 1.